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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/559,965      | 08/21/2006  | Gunter Weickert      | 067670-5009US       | 6544             |

28289 7590 11/04/2009  
THE WEBB LAW FIRM, P.C.  
700 KOPPERS BUILDING  
436 SEVENTH AVENUE  
PITTSBURGH, PA 15219

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| EXAMINER |
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CHEUNG, WILLIAM K

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| ART UNIT | PAPER NUMBER |
|----------|--------------|

1796

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| MAIL DATE | DELIVERY MODE |
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11/04/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/559,965 | <b>Applicant(s)</b><br>WEICKERT ET AL. |  |
|                              | <b>Examiner</b><br>WILLIAM K. CHEUNG | <b>Art Unit</b><br>1796                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9, 12-32 and 34-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 12-32 and 34-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. The examiner acknowledges the receipt of the IDS and amendment filed August 7, 2009.
2. In view of the amendment filed August 7, 2009, claims 10, 11, 33, 39-41 have been cancelled. Claims 1-9, 12-32, 34-38 are pending.
3. In view of the amendment filed August 7, 2009, the objection of claim 10 has been withdrawn. Further, the rejection of claims 40-41 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Harlin et al. (US 6,469,110), is withdrawn.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 23-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 (line 12), the word "means for controlling" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967).

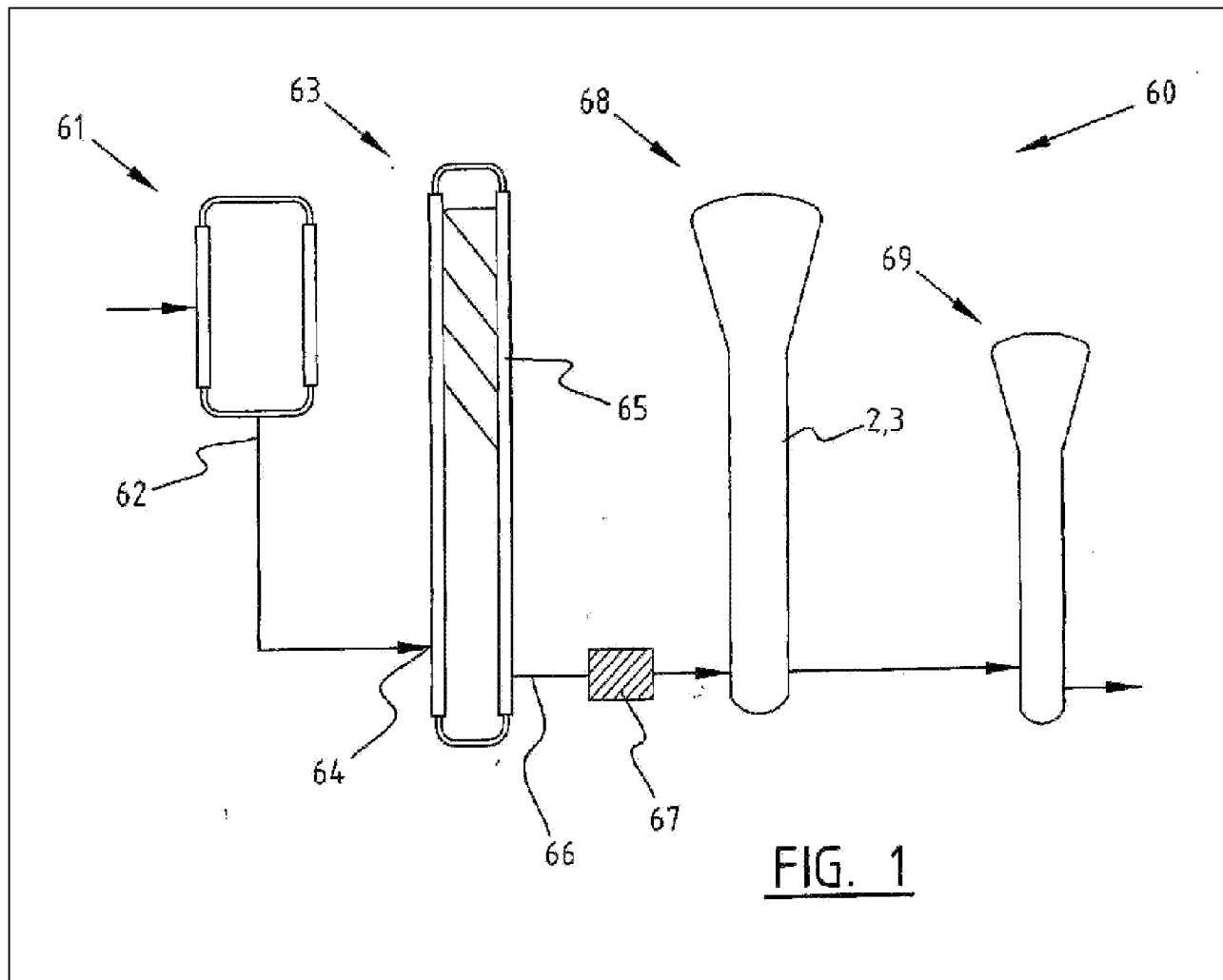
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Claim 27(line 2), the word "means for removing" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967).

Claim 27(line 3), the word "means for separating" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967).

### **Invention Summary**

Applicants' invention is related to the reactor system as depicted in Figure 1 below.



***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-9, 12-32, 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harlin et al. (US 6,469,110) in view of Mutsers et al. (WO 02/41986 A1) for the reasons adequately set forth from paragraph 7 of the office action of March 9, 2009.

Claim 1 (Original): Process for the catalytic polymerization of olefins comprising the steps of;

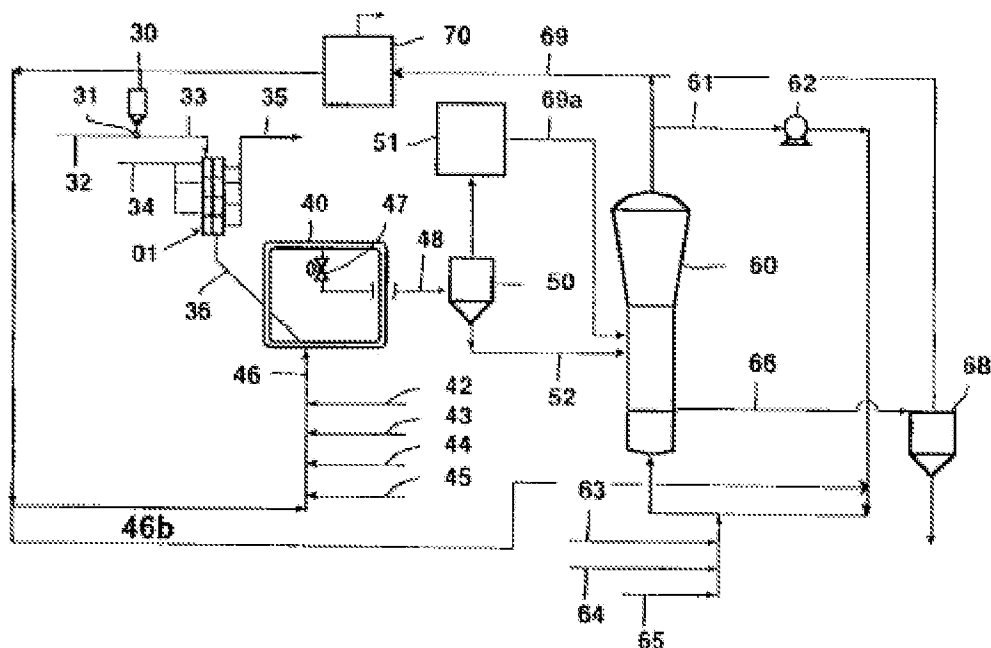
i) a first polymerization in a first reactor, wherein olefins are polymerized with a particulate catalyst, hydrogen and optional a comonomer in a fluidum of an inert low boiling hydrocarbon medium into an reaction mixture comprising polymerized olefins; and

ii) a second polymerization in a second reactor, wherein the polymerized olefins are further polymerized in a fluidized bed and in a moving bed under such conditions that the residence time in the fluidized bed and the residence time in the moving bed are independently controlled, wherein the residence time in the moving bed is controlled by controlling the outflow rate of particles from the moving bed.

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Claim 23 (Currently Amended): Reactor system for the catalytical polymerization of olefins comprising a first polymerization reactor for carrying out the first polymerization, which first reactor comprises inlets for olefins, catalyst, hydrogen, optional comonomer, and inert low boiling hydrocarbon medium, the first reactor further comprises a product outlet for a reaction mixture comprising polymerized olefins; and wherein the product outlet of the first reactor is connected to an inlet of a second reactor for carrying out the second polymerization, which second reactor comprises a reactant inlet, a fluidized bed unit, a moving bed unit and a product outlet, wherein the fluidized bed unit comprises means for maintaining a fluidized bed in the fluidized bed unit, ~~and wherein the moving bed unit is provided with an inlet directly connected to the fluidized bed unit such that the residence time in the fluidized bed unit and the residence time in the moving bed unit are independently controlled, and the outlet of the~~  
moving bed unit is provided with means for controlling the outflow rate of particles from the moving bed unit.

Harlin et al. (Figure 1) disclose a polymerization process for preparing polypropylene in a reactor system comprising pluralities of reactors. Harlin et al. (col. 11, line 17-48) clearly indicate that the polymerization process of Harlin et al. comprises a prepolymerization reactor (1), a first loop reactor (40), and a second gas phase (fluidized bed) reactor (60). Harlin et al. (col. 16, claim 24) clearly teach that a third gas phase reactor can be installed.



- |    |  |    |
|----|--|----|
| 1  | prepolymerization reactor                        |    |
| 30 | catalyst reservoir                               |    |
| 31 | feeding device                                   | 30 |
| 32 | diluent  |    |
| 33 | catalyst-diluent mixture                         |    |
| 34 | monomer  |    |
| 35 | catalyst and possible donors                     |    |
| 40 | loop reactor                                     | 25 |
| 42 | diluent feed (optional)                          |    |
| 43 | monomer feed                                     |    |
| 44 | hydrogen feed                                    |    |
| 45 | comonomer feed (optional)                        |    |
| 46 | back to the loop reactor 40 through the line 46  | 30 |
| 47 | one or several exhaust valve                     |    |
| 48 | product transfer line                            |    |
| 50 | flash separator                                  |    |
| 51 | recovery unit and off gas vent                   |    |
| 52 | removing line                                    | 38 |
| 60 | gas phase reactor                                |    |
| 61 | gas transfer line                                |    |
| 62 | compressor                                       |    |
| 63 | monomer feed                                     |    |
| 64 | comonomer feed                                   | 40 |
| 65 | hydrogen feed                                    |    |
| 66 | transfer line                                    |    |
| 67 | product transfer line                            |    |
| 68 | polymer product recovery system, e.g. flash tank |    |
| 69 | recovery line                                    | 48 |
| 70 | monomer recovery system                          |    |
| 71 | separation unit                                  |    |



Regarding the polymerization temperature and pressure requirements of claims 4, 7, Harlin et al. (col. 8, line 48-65) clearly teach the polymerization temperature of from 40 to 110°C and the pressure of 30 to 100 bar, which meet the requirements as claimed.

Regarding the claimed "liquid phase" of claim 3 and the "propane" of claim 6, Harlin et al. (col. 5, line 62-64) clearly teach the use of propane as a medium.

Regarding claims 8 and 9, Harlin et al. (col. 11, line 33, item 50) clearly disclose the presence of a flash separator for removing hydrocarbons and/or hydrogen, which are clearly present in the reactor (col. 8, line 35-40).

In view of the substantially identical processing condition, reactants, and apparatus disclosed in Harlin et al. and as claimed, the examiner has a reasonable basis to believe that the claimed "the loop reactor is adapted to work under supercritical conditions" is inherently possessed in Harlin et al. The rationale set forth for the instant rejection is adequate since claim 25 fails to set forth any conditions or features that are required for running the polymerization process under supercritical conditions.

Regarding the claimed feature "the residence time in the moving bed is controlling by controlling the outflow rate of particles from the moving bed" (supported by specification, page 8, paragraph 4), in view of the substantially identical reactors disclosed in Harlin et al. and as claimed, the examiner has a reasonable that the ability of the apparatus disclosed in Harlin et al. inherently possessed the argued feature being claimed. Applicants must recognize that the apparatus comprises conduits that transfer from one reactor to the next, it would not be difficult to one of ordinary skill in art that the

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transferring of mass from one reactor to the next would associate a change or a control on residence time. Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise. In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977); In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

The difference between the invention as claimed and the process of Harlin et al. is that Harlin et al. do not teach process involving a second reactor comprising a moving bed under such conditions that the residence time in the fluidized bed and the residence time in the moving bed are independently controlled.

Mutsers et al. (abstract) disclose a polymerization process where a fluidized bed reactor comprises a reaction chamber 4 that applicants characterized as a fluidized bed, and a reactor 2 which comprises one or more connecting pipes (10) running outside the reactor chamber 4, which applicants' specification (page 10, line 2-7) characterized as moving bed. Regarding the claimed "independently control" feature, Mutsers et al. (page 10, claim 1, 2, 4) clearly indicate that one or more connecting pipes running outside, where the cross-section ratio of the pipes to the reactor's cross-section can vary from 0.1 to 1.0, the angle can vary between 0 to 60 degree. Motivated by the expectation of success of introducing fresh monomer at the connection of the connecting pipes to the wall of the top part of the reactor chamber or to the wall of the outlet section (page 4, line 1-5), it would have been obvious to one of ordinary skill in art to replace the fluidized bed reactor of Harlin et al. with the fluidized bed reactor of Mutsers et al. to obtain the fluidized bed reactor having the "moving bed" as claimed.

In view of applicants' specification (page 9, line 15-24) which states the requirement on how "independent control" can be achieved, the examiner has a reasonable basis that the teachings of Mutsers et al. have adequately taught the means for the claimed "independent control" feature. Although applicants' specification (figure 2 and 3) indicates some specific features, such as inlet and nozzles installed in the moving bed for the purpose of "independent control", the features described in the specification can not be read into the claims. Therefore, further in view of the 112 rejection set forth, the rationale for the instant reaction is adequate.

Regarding claims 12-18, 21, which contain process related features, such as "condensed mode", "a separation fluidum", "the residence time in the moving bed is independently controlled", and "the residence time in the moving bed is controlling by controlling the outflow rate of particles from the moving bed", since Harlin et al. clearly teach a process and apparatus that are substantially identical to the one as claimed, the examiner has a reasonable basis that any minor variation of such teachings is considered obvious because motivated by the expectation of success of obtaining the polymerization process of Harlin et al., it would have been obvious to one of ordinary skill in art to vary the process of Harlin et al. to obtain the features of claims 10-18, and 21.

Regarding the rejection of claims 23-38, in view of the 112 rejection set forth, the rationale set forth for the rejection is adequate.

***Response to Arguments***

8. Applicant's arguments filed August 7, 2009 have been fully considered but they are not persuasive. Applicants argue that the prior art do not teach the feature where "the residence time in the moving bed is controlling by controlling the outflow rate of particles from the moving bed", the examiner disagrees, in view of the substantially identical reactors disclosed in Harlin et al. and as claimed, the examiner has a reasonable that the ability of the apparatus disclosed in Harlin et al. inherently possessed the argued feature being claimed. Applicants must recognize that the apparatus comprises conduits that transfer from one reactor to the next, it would not be difficult to one of ordinary skill in art that the transferring of mass from one reactor to the next would associate a change or a control on residence time. Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise. In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977); In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

In view of the reasons set forth above, the rejection of claims 1-9, 12-32, 34-38 is maintained.

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM K. CHEUNG whose telephone number is (571)272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William K Cheung/  
Primary Examiner, Art Unit 1796

William K. Cheung, Ph. D.  
Primary Examiner  
November 3, 2009